1. Solve the equation for x and choose the interval that contains x (if it exists).

$$20 = \ln \sqrt[6]{\frac{22}{e^{8x}}}$$

A. $x \in [-5.4, -3.4]$

B. $x \in [-3.2, -1.4]$

C. $x \in [13, 15.7]$

D. There is no Real solution to the equation.

E. None of the above.

2. Which of the following intervals describes the Range of the function below?

$$f(x) = -\log_2 (x + 6) - 1$$

A. $[a, \infty), a \in [-9.2, -5.9]$

B. $(-\infty, a), a \in [-5.2, -0.2]$

C. $(-\infty, a), a \in [-0.1, 4.6]$

D. $[a, \infty), a \in [4.7, 10]$

E. $(-\infty, \infty)$

3. Solve the equation for x and choose the interval that contains the solution (if it exists).

$$5^{-4x-2} = \left(\frac{1}{49}\right)^{-2x+4}$$

A. $x \in [0.4, 2.6]$

B. $x \in [5.2, 7.2]$

C. $x \in [-2, 0]$

D. $x \in [-3.9, -2.4]$

E. There is no Real solution to the equation.

4. Which of the following intervals describes the Range of the function below?

$$f(x) = e^{x-7} - 1$$

A. $(a, \infty), a \in [-3.6, 0]$

B. $(-\infty, a), a \in [0.3, 1.5]$

C. $(-\infty, a], a \in [0.3, 1.5]$

D. $[a, \infty), a \in [-3.6, 0]$

E. $(-\infty, \infty)$

5. Solve the equation for x and choose the interval that contains x (if it exists).

$$25 = \sqrt[3]{\frac{29}{e^{4x}}}$$

A. $x \in [0.76, 1.7]$

B. $x \in [-1.12, -0.65]$

C. $x \in [-20.26, -19.24]$

D. There is no Real solution to the equation.

E. None of the above.

6. Which of the following intervals describes the Domain of the function below?

$$f(x) = -\log_2 (x + 1) + 8$$

A. $(a, \infty), a \in [-1.5, -0.8]$

B. $(-\infty, a], a \in [-8.6, -7.2]$

C. $(-\infty, a), a \in [0.7, 4.1]$

D. $[a, \infty), a \in [6.3, 8.2]$

E. $(-\infty, \infty)$

7. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$\log_4 (2x + 6) + 4 = 3$$

A. $x \in [-2.8, -1.67]$

B. $x \in [2.81, 4.24]$

C. $x \in [28.12, 29.65]$

D. $x \in [-2.96, -2.79]$

E. There is no Real solution to the equation.

8. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$2^{-3x-5} = 27^{-2x+3}$$

A. $x \in [-9, -6.5]$

B. $x \in [1.8, 5]$

C. $x \in [-14.2, -11.5]$

D. $x \in [1.3, 2.4]$

E. There is no Real solution to the equation.

9. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$\log_4 (2x + 7) + 6 = 2$$

A. $x \in [2.5, 12.5]$

B. $x \in [119.5, 129.5]$

C. $x \in [-5.5, -1.5]$

D. $x \in [127.5, 133.5]$

E. There is no Real solution to the equation.

10. Which of the following intervals describes the Range of the function below?
$$f(x) = -e^{x+8} - 9$$

A. $(-\infty, a], a \in [-11, -2]$

B. $(a, \infty), a \in [7, 13]$

C. $(-\infty, a), a \in [-11, -2]$

D. $[a, \infty), a \in [7, 13]$

E. $(-\infty, \infty)$

11. Solve the equation for x and choose the interval that contains x (if it exists).
$$10 = \sqrt[5]{\frac{22}{e^{8x}}}$$

A. $x \in [-0.9, -0.18]$

B. $x \in [-7.57, -5.58]$

C. $x \in [-1.85, -0.73]$

D. There is no Real solution to the equation.

E. None of the above.

12. Which of the following intervals describes the Range of the function below?
$$f(x) = \log_2 (x - 3) + 2$$

A. $(-\infty, a), a \in [1.23, 2.99]$

B. $[a, \infty), a \in [2.99, 5.41]$

C. $[a, \infty), a \in [-4.36, -2.85]$

D. $(-\infty, a), a \in [-2.45, -1.86]$

E. $(-\infty, \infty)$

13. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$5^{-5x-4} = 27^{-3x+3}$$

   A. $x \in [8.87, 9.87]$

   B. $x \in [3.8, 5.8]$

   C. $x \in [-3.5, -2.5]$

   D. $x \in [-12.16, -7.16]$

   E. There is no Real solution to the equation.

14. Which of the following intervals describes the Domain of the function below?
$$f(x) = e^{x-3} - 5$$

   A. $(-\infty, a], a \in [-5, -3]$

   B. $(-\infty, a), a \in [-5, -3]$

   C. $[a, \infty), a \in [2, 12]$

   D. $(a, \infty), a \in [2, 12]$

   E. $(-\infty, \infty)$

15. Solve the equation for x and choose the interval that contains x (if it exists).
$$12 = \sqrt[3]{\frac{24}{e^{6x}}}$$

   A. $x \in [-6.68, -6.49]$

   B. $x \in [-0.52, 0.11]$

   C. $x \in [0.53, 1.91]$

   D. There is no Real solution to the equation.

   E. None of the above.

16. Which of the following intervals describes the Range of the function below?

$$f(x) = \log_2 (x - 8) - 5$$

A. $(-\infty, a), a \in [1.4, 5.1]$

B. $[a, \infty), a \in [7.8, 10.8]$

C. $(-\infty, a), a \in [-7.6, -3.9]$

D. $[a, \infty), a \in [-8.6, -7.7]$

E. $(-\infty, \infty)$

17. Solve the equation for x and choose the interval that contains the solution (if it exists).

$$\log_4 (3x + 6) + 4 = 3$$

A. $x \in [-1.93, -1.85]$

B. $x \in [-1.68, -1.07]$

C. $x \in [19.2, 20.36]$

D. $x \in [2.25, 2.53]$

E. There is no Real solution to the equation.

18. Solve the equation for x and choose the interval that contains the solution (if it exists).

$$3^{4x-2} = 125^{2x+2}$$

A. $x \in [-3.5, -1.3]$

B. $x \in [3.8, 7.3]$

C. $x \in [-1.6, 0.1]$

D. $x \in [1.5, 3]$

E. There is no Real solution to the equation.

19. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$\log_3 (2x + 5) + 6 = 3$$

A. $x \in [-23, -13]$

B. $x \in [-7.48, 0.52]$

C. $x \in [11, 20]$

D. $x \in [-11, -4]$

E. There is no Real solution to the equation.

20. Which of the following intervals describes the Domain of the function below?
$$f(x) = -e^{x-2} - 6$$

A. $[a, \infty), a \in [5, 13]$

B. $(a, \infty), a \in [5, 13]$

C. $(-\infty, a), a \in [-7, -5]$

D. $(-\infty, a], a \in [-7, -5]$

E. $(-\infty, \infty)$

21. Solve the equation for x and choose the interval that contains x (if it exists).
$$13 = \sqrt[6]{\frac{26}{e^{6x}}}$$

A. $x \in [-15.2, -12.8]$

B. $x \in [-0.4, 0.5]$

C. $x \in [-2.2, -1.3]$

D. There is no Real solution to the equation.

E. None of the above.

22. Which of the following intervals describes the Range of the function below?
$$f(x) = \log_2 (x - 5) + 8$$

    A. $(-\infty, a), a \in [-12, -7]$

    B. $[a, \infty), a \in [0, 6]$

    C. $(-\infty, a), a \in [7, 11]$

    D. $[a, \infty), a \in [-7, -4]$

    E. $(-\infty, \infty)$

23. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$3^{-5x-3} = \left(\frac{1}{125} \right)^{-2x+4}$$

    A. $x \in [-3.4, -1.8]$

    B. $x \in [4.7, 7]$

    C. $x \in [0.1, 3.2]$

    D. $x \in [-1.7, 0.1]$

    E. There is no Real solution to the equation.

24. Which of the following intervals describes the Domain of the function below?
$$f(x) = e^{x-4} - 9$$

    A. $(a, \infty), a \in [6, 15]$

    B. $(-\infty, a), a \in [-10, -7]$

    C. $[a, \infty), a \in [6, 15]$

    D. $(-\infty, a], a \in [-10, -7]$

    E. $(-\infty, \infty)$

25. Solve the equation for x and choose the interval that contains x (if it exists).
$$21 = \ln \sqrt[6]{\frac{22}{e^{3x}}}$$

A. $x \in [-12.97, -11.97]$

B. $x \in [-42.97, -36.97]$

C. $x \in [-9.12, -4.12]$

D. There is no Real solution to the equation.

E. None of the above.

26. Which of the following intervals describes the Domain of the function below?
$$f(x) = \log_2 (x - 5) - 8$$

A. $(-\infty, a), a \in [-5.3, -3.2]$

B. $(-\infty, a], a \in [7.3, 12.2]$

C. $(a, \infty), a \in [3.8, 5.2]$

D. $[a, \infty), a \in [-9.5, -6.9]$

E. $(-\infty, \infty)$

27. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$\log_4 (-3x + 7) + 4 = 2$$

A. $x \in [-6, -2]$

B. $x \in [-12.67, -5.67]$

C. $x \in [-1.69, 6.31]$

D. $x \in [-6, -2]$

E. There is no Real solution to the equation.

28. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$2^{-3x+5} = \left(\frac{1}{9}\right)^{-4x-3}$$

    A. $x \in [-1.29, 0.71]$

    B. $x \in [2.13, 7.13]$

    C. $x \in [-8, -6]$

    D. $x \in [-0.26, 1.74]$

    E. There is no Real solution to the equation.

29. Solve the equation for x and choose the interval that contains the solution (if it exists).
$$\log_5 (3x + 7) + 6 = 3$$

    A. $x \in [-4.33, -1.33]$

    B. $x \in [-89.33, -82.33]$

    C. $x \in [38.33, 41.33]$

    D. $x \in [-79.67, -76.67]$

    E. There is no Real solution to the equation.

30. Which of the following intervals describes the Domain of the function below?
$$f(x) = e^{x-1} - 6$$

    A. $(-\infty, a), a \in [-8, -5]$

    B. $(-\infty, a], a \in [-8, -5]$

    C. $(a, \infty), a \in [3, 10]$

    D. $[a, \infty), a \in [3, 10]$

    E. $(-\infty, \infty)$